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(54) **HAND POWER TOOL DEVICE**

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USPC 173/210, 211, 162.1; 279/19.1, 19.7, 279/19; 267/137, 138, 140, 257, 258, 292
See application file for complete search history.

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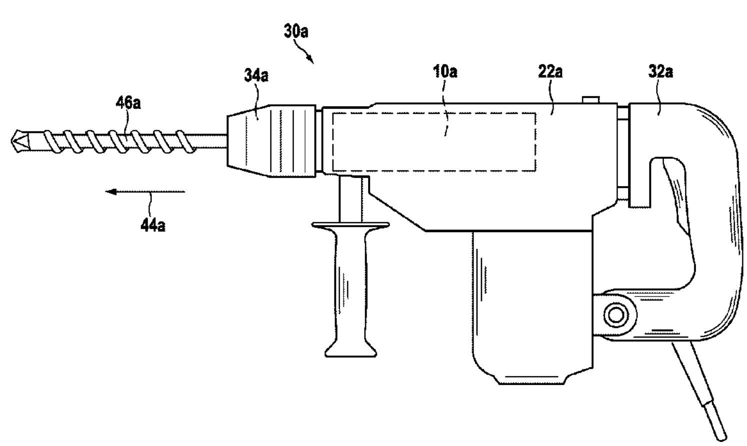
(57) **ABSTRACT**

A hand power tool device includes a hammer tube and a B-impact damping system. The B-impact damping system includes at least one damping mechanism configured to damp recoil energy. The damping mechanism is disposed at least partially radially outside of the hammer tube in at least one operating state.

16 Claims, 4 Drawing Sheets



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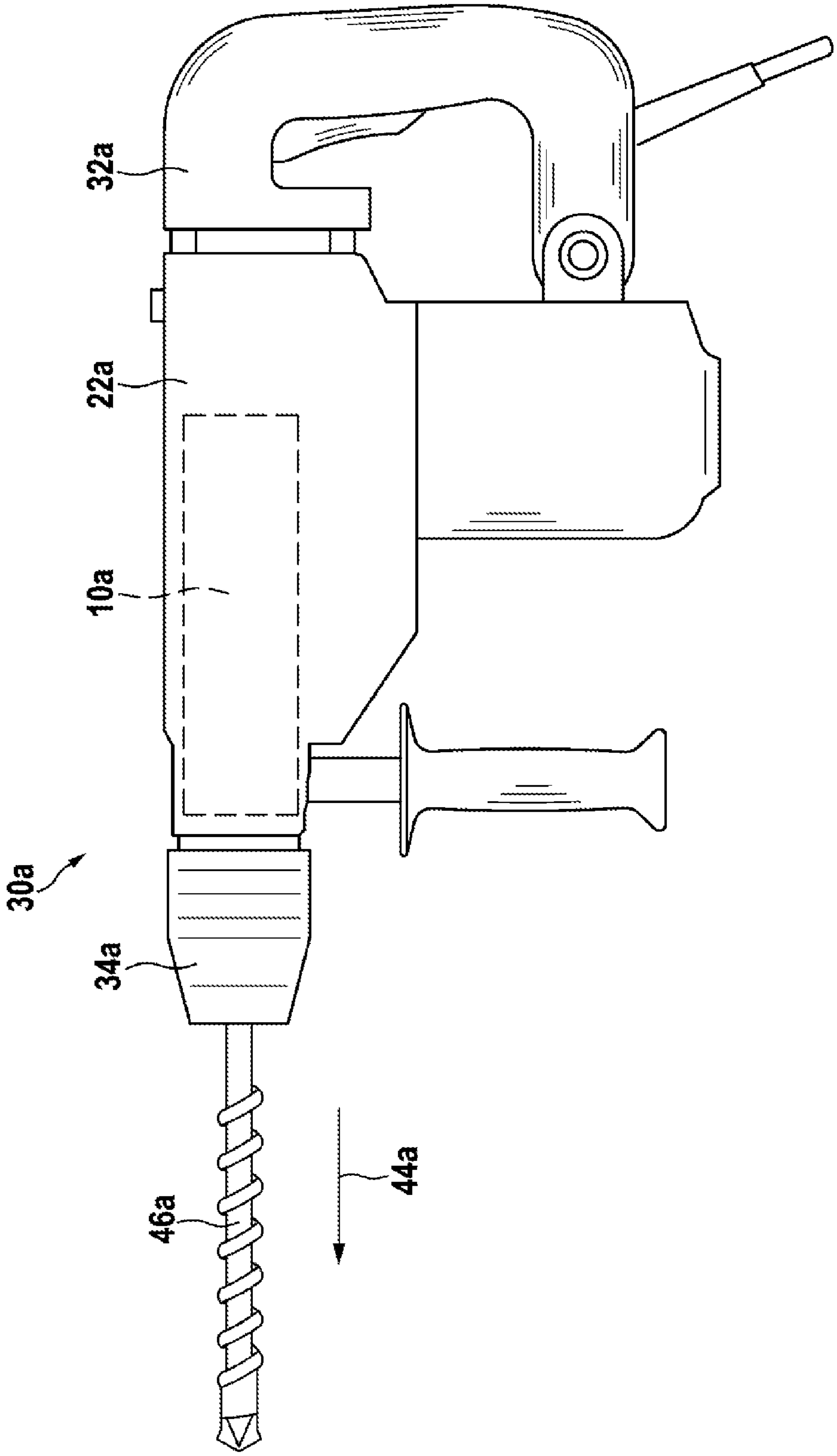

Fig. 1

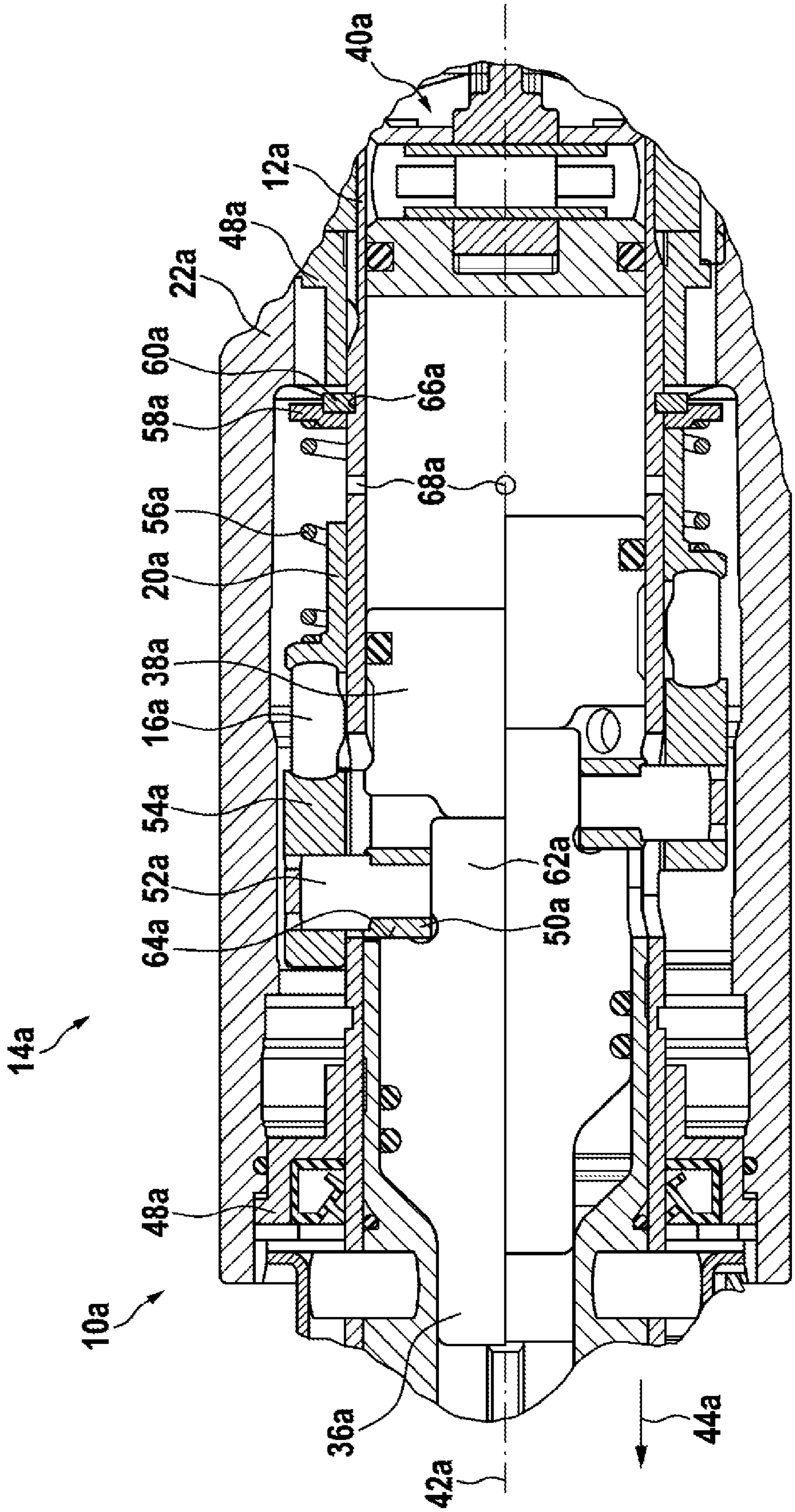
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Fig. 2

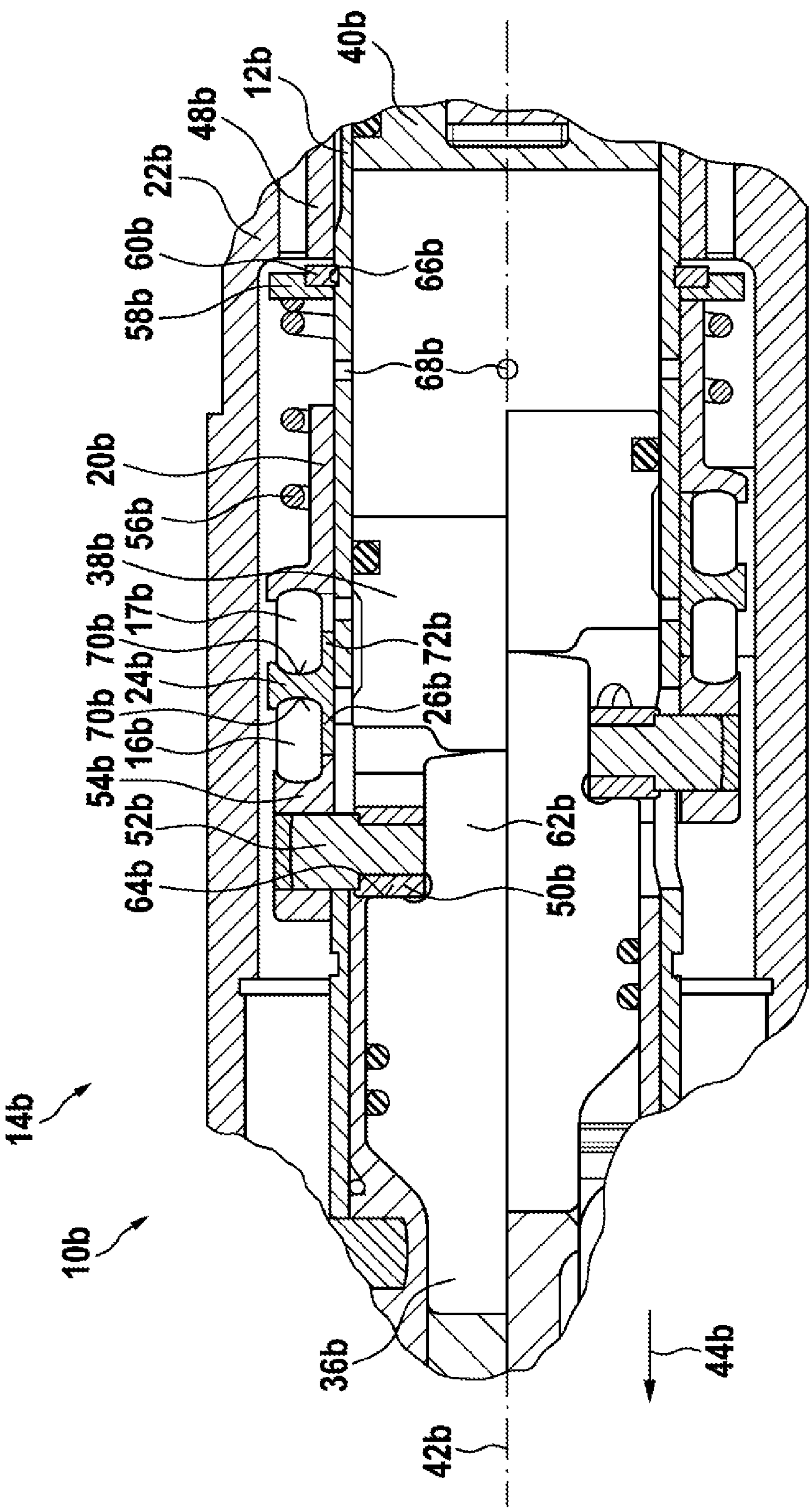
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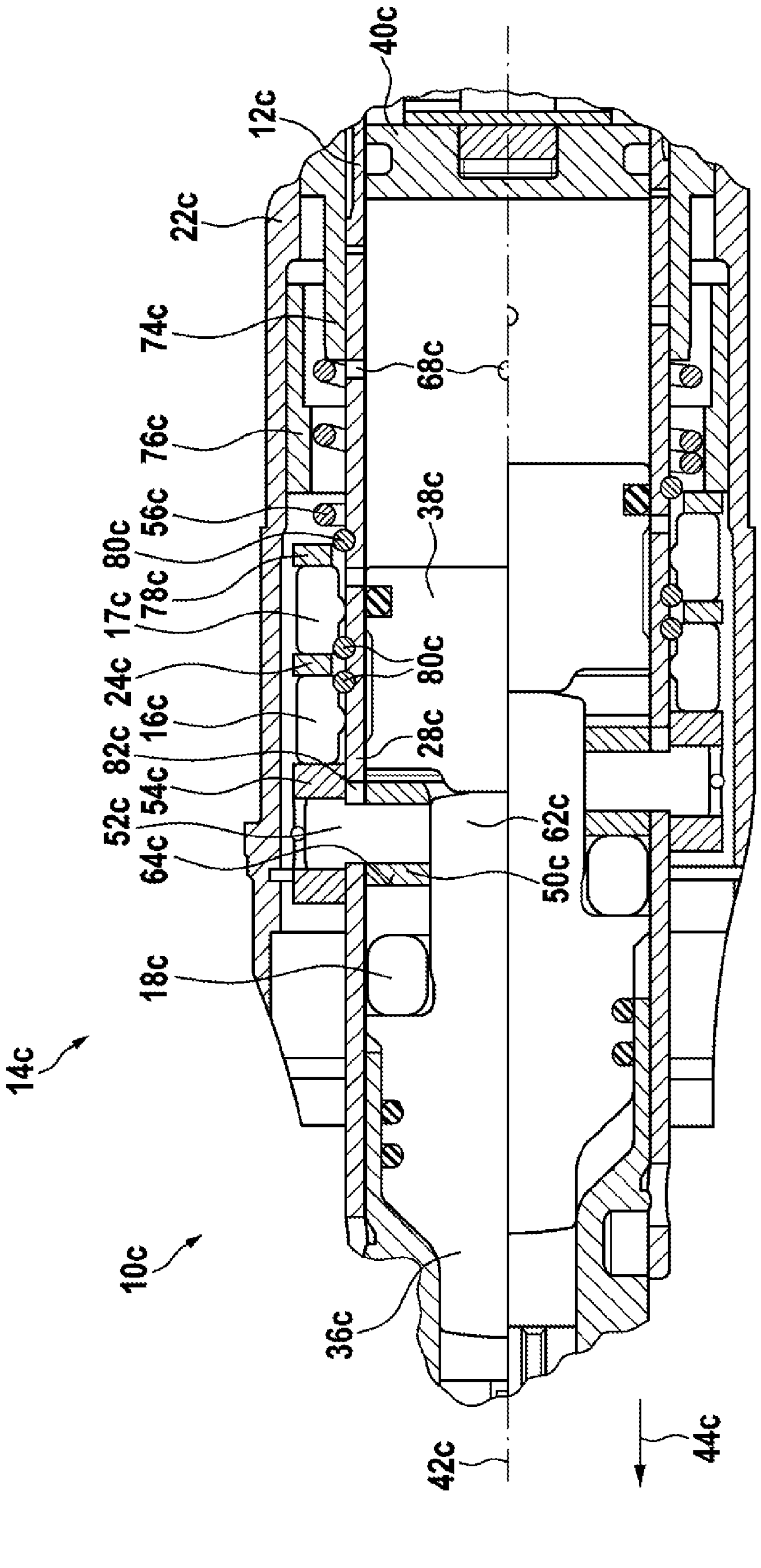
Fig. 3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54c
52c
62c
64c
50c
18c
14c
10c
36c
42c
44c

Fig. 4

HAND POWER TOOL DEVICE

This application is a 35 U.S.C. §371 National Stage Application of PCT/EP2011/056077, filed on Apr. 18, 2011, which claims the benefit of priority to Serial No. DE 10 2010 027 941.2, filed on Apr. 20, 2010 in Germany and to Serial No. DE 10 2011 007 433.3, filed on Apr. 14, 2011 in Germany, the disclosures of which are incorporated herein by reference in their entirety.

BACKGROUND

The disclosure is based on a hand power tool device.

A hand power tool device has already been proposed in EP 1 992 453 A1, in particular for a rotary and/or chipping hammer, having a hammer tube and a B-impact damping system comprising at least one damping means that is provided to damp recoil energy.

SUMMARY

The disclosure is based on a hand power tool device having a hammer tube and a B-impact damping system comprising at least one damping means that is provided to damp a recoil energy.

It is proposed that, in at least one operating state, the damping means is disposed at least partially radially outside of the hammer tube. A "hammer tube" is to be understood to be, in particular, a means provided to mount a striker such that it is movable in a main working direction. Preferably, a working air pressure that, in at least one operating state, accelerates the striker can be built up inside the hammer tube in at least one operating state. The term "striker" is to be understood to mean, in particular, a means that is accelerated by the working air pressure during impact operation and that delivers an impact impulse to an insert tool in the main working direction. Preferably, a piston generates the working air pressure. The term "main working direction" is to be understood to mean, in particular, a direction in which an operator moves the rotary hammer during a working motion in the provided manner. Preferably, the main working direction is aligned parallelwise in relation to an impact direction of the striker. "Provided" is to be understood to mean, in particular, specially equipped and/or designed. In particular, a "B-impact damping system" is to be understood to be a device provided to transfer a recoil energy in a damped manner, at least partially, to a hand power tool housing. In particular, a "recoil energy" is to be understood to be an energy that, when an insert tool impacts upon a workpiece, is reflected by the workpiece in the direction of the insert tool. Preferably, the recoil energy accelerates an impact means of the hand power tool device contrary to the impact direction. Preferably, the B-impact damping system is provided to effect damped braking of the motion caused by the recoil energy of the impact means. Preferably, the recoil energy is carried by a compressive stress wave. "Damping" in this context is to be understood to mean, in particular, that the B-impact damping system reduces an amplitude of a recoil force through friction and/or elastic deformation of the damping means. A "damping means" is to be understood to be, in particular, a means realized so as to be deformable by the recoil energy by at least 10%, advantageously at least 25%, of a length in the direction of loading. Alternatively and/or additionally, through friction, by means of a specially realized surface, the damping means could convert a part of the recoil energy into thermal energy. In particular, at least 25%, advantageously at least 50%, particularly advantageously at least 75%, of the recoil energy acts upon the damping means during operation. Preferably, the damping means is constituted at least partially by an elastic material such as, for example, an elastomer material. Alternatively and/or additionally, the damping means could have one or more damping, spring and/or shaped elements. The damping elements could be realized, for example, as thermoplastic elastomers, elastic steel springs, gaseous, viscous and/or solid damping elements. Preferably, the damping means is separate from a counterpressure spring. Preferably, the damping means is provided to damp the recoil without a limit stop. The term "without a limit stop" in this context is to be understood to mean, in particular, that, by means of a counterpressure, the damping means itself limits a value of its compression in the damping of the recoil energy. In particular, a "counterpressure spring" is to be understood to be a spring that can be compressed by more than 10%, advantageously more than 25%, of its length by a user as a result of the insert tool being pressed onto the workpiece. Preferably, the hand power tool device has a stop that, in at least one operating state, prevents a further compression of the counterpressure spring. Preferably, the damping element has a spring hardness that is at least five times as great, preferably at least ten times as great, as the counterpressure spring. Preferably, in at least one operating state, the counterpressure spring moves a no-load control means. Advantageously, the damping means damps the recoil energy independently of a counterpressure spring and/or, in particular, parallelwise in relation to a counterpressure spring. In the case of a hand power tool device that does not have a counterpressure spring, the damping means damps the recoil energy "independently of a counterpressure spring". "Parallelwise" in this context is to be understood to mean, in particular, that a recoil impulse caused by the recoil energy is routed, via the damping means and then via an element, in the direction of a main handle that is parallel to the counterpressure spring. The term "act" in this context is to be understood to mean, in particular, that a recoil impulse that carries the recoil energy generates a force upon the damping means that deforms the damping means. The expression "radially outside of" is to be understood to mean, in particular, that at least one region of the damping means is at a greater distance from a center axis of the hammer tube in a radial direction than an average outer surface of the hammer tube. The design of the hand power tool device according to the disclosure makes it possible to achieve a particularly short axial structural length and a particularly effective B-impact damping. Furthermore, a large volume that can be achieved in a structurally simple manner makes it possible to achieve a low specific loading of the damping means. Consequently, inexpensive materials can be used for damping.

In a further design, it is proposed that the damping means at least partially surrounds the hammer tube, such that a particularly advantageous utilization of structural space and advantageous cooling are possible. The term "surround" is to be understood to mean, in particular, that, in an axial extent region of the hammer tube, the damping means is disposed at least partially radially outside of the hammer tube. Advantageously, the damping means surrounds the hammer tube on an angular region of at least 270 degrees, particularly advantageously around 360 degrees.

Furthermore, it is proposed that the hand power tool device has a no-load control means that, in at least one operating state, transfers at least a part of the recoil energy, thereby making it possible to achieve a particularly effective recoil damping and to save on components. In addition, the no-load control device can be realized with a low susceptibility to vibration. In general, it is advantageous if the recoil energy is diverted to the hand power tool housing via as many components as possible. At each interface from one component to another, recoil energy is dissipated and force peaks are reduced. A "no-load control means" is to be understood to mean, in particular, a means provided to close at least one control opening of the hammer tube in at least one operating state. Preferably, the counterpressure spring is provided to directly and/or indirectly displace the no-load control means into a no-load position. A "part of the recoil energy" is to be understood in this context to mean, in particular, the part of the recoil energy that is transferred to the hand power tool device by the damping means during operation.

Further, it is proposed that, in at least one operating state, the no-load control means supports a part of the recoil energy, in particular directly on the hammer tube and/or on a hand power tool housing, thereby enabling an advantageous transfer of the recoil energy to be achieved in a structurally simple manner. In particular, "support" is to be understood to mean that the hammer tube and/or the hand power tool housing effects a counterforce that acts contrary to a force of the recoil energy.

In addition, it is proposed that the B-impact damping system has at least two damping means connected in series, thereby making it possible to achieve a reliable damping, having an advantageous spring characteristic, in a structurally simple manner. "Connected in series" is to be understood to mean, in particular, that a part of the recoil energy acts upon a second damping means via at least one first damping means.

Furthermore, it is proposed that the B-impact damping system has at least one support element, which is disposed between the damping means, thereby making it possible to prevent unstable deformation behaviors such as, for example, turning over. A "support element" is to be understood to be, in particular, an element provided to effect a force upon the damping means in a direction that differs from the main working direction.

In an advantageous realization of the disclosure, it is proposed that the B-impact damping system has at least one bypass means provided to bypass at least one of the damping means. A "bypass means" is to be understood to mean, in particular, a region of a component that, in at least one operating state, effects a transfer of force functionally parallelwise in relation to the damping means. Preferably, the bypass means becomes effective from a particular compression of the damping means onwards. The bypass means makes it possible to achieve a particularly advantageous spring characteristic.

Furthermore, it is proposed that the damping means have differing damping properties. In particular, "differing damping properties" are to be understood to mean, in particular, a differing spring hardness, a differing energy absorption upon deformation and/or other properties considered appropriate by persons skilled in the art. The differing damping properties make it possible to achieve an advantageous spring characteristic, in particular having a progressive stiffness characteristic.

Further, it is proposed that the hammer tube is mounted so as to be movable relative to a hand power tool housing, thereby making it possible to achieve a hand power tool device having particularly low vibration, in particular in that the hammer tube executes compensatory motions that reduce vibration.

Further, the disclosure is based on a hand power tool comprising a hand power tool device, wherein all hand power tools considered appropriate by persons skilled in the art, such as, in particular, chipping hammers, screwdrivers and/or, in particular, rotary hammers, would be conceivable for operation with a hand power tool device, thereby making it possible to provide a particularly low-vibration, light, compact and inexpensive hand power tool that has a long service life and a particularly small axial structural length.

BRIEF DESCRIPTION OF THE DRAWINGS

Further advantages are given by the following description of the drawing. Three exemplary embodiments of the disclosure are represented in the drawings. The drawings, the description and the claims contain numerous features in combination. Persons skilled in the art will, expediently, also consider the features individually and combine them to form appropriate, further combinations.

In the drawing drawings:

FIG. **1** shows a hand power tool comprising a hand power tool device according to the disclosure,

FIG. **2** shows a first exemplary embodiment of the hand power tool device from FIG. **1**, comprising a damping means,

FIG. **3** shows a second exemplary embodiment of the hand power tool device from FIG. **1**, comprising a plurality of damping means, and

FIG. **4** shows a third exemplary embodiment of the hand power tool device from FIG. **1**, comprising a movably mounted hammer tube.

DETAILED DESCRIPTION

FIG. **1** shows a hand power tool **30***a* comprising a hand power tool device **10***a* according to the disclosure, a hand power tool housing **22***a*, a main handle **32***a* and a tool chuck **34***a*. The hand power tool **30***a* is realized as a rotary and chipping hammer. The hand power tool device **10***a* is disposed inside the hand power tool housing **22***a*, specifically between the main handle **32***a* and the tool chuck **34***a*.

FIG. **2** shows a detail view of the hand power tool device **10***a*. The hand power tool device **10***a* has a hammer tube **12***a*, a B-impact damping system **14***a*, an impact means **36***a*, a striker **38***a* and a piston **40***a*. In FIG. **2**, a no-load operating state is shown above the center axis **42***a* of the hammer tube **12***a*. Shown below the center axis **42***a* is an operating state during an impact. The striker **38***a* and the piston **40***a* are mounted so as to be movable in the hammer tube **12***a*. The striker **38***a* is disposed in front of the piston **40***a* in the main working direction **44***a*, specifically between the piston **40***a* and the impact means **36***a*. The impact means **36***a* is disposed between the tool chuck **34***a* and the striker **38***a*.

During impact and rotary impact operation, the piston **40***a* generates in the hammer tube **12***a* a working air pressure that differs from an ambient air pressure. The working air pressure accelerates the striker **38***a*. During an impact, the striker **38***a* delivers an impact energy to the impact means **36***a*. The impact means transfers the impact energy on to an insert tool **46***a*. During a working operation, the impact energy acts upon a workpiece, not represented in greater detail. A part of the impact energy is reflected, as recoil energy, by the workpiece. The recoil energy, via the impact means **36***a*, acts upon the B-impact damping system **14***a*. During rotary impact and rotary operation, the hammer tube **12***a* is driven in rotation about the center axis **42***a*. For this purpose, the hammer tube is mounted in the hand power tool housing **22***a* in a rotatable and axially fixed manner by two bearings **48***a*. The hammer tube **12***a* is connected to the tool chuck **34***a* in a rotationally fixed manner.

The B-impact damping system **14***a* has a damping means **16***a*, which is realized as a damping ring. The damping means **16***a* has an elastomer material. During operation, the damping means **16***a* is acted upon by the entire recoil energy, apart from a portion of the recoil energy that, through friction, is diverted between the damping means **16***a* and the insert tool **46***a*. The damping means **16***a* damps the recoil energy without a limit stop. This means that, through an elastic deformation, the damping means **16***a* effects a force that acts contrary to the recoil and that limits the deformation of the damping means **16***a*. In particular, no limit stop effects a force functionally parallelwise in relation to the damping means **16***a*. During damping, the damping means **16***a* undergoes only elastic deformation. The damping means **16***a* is disposed in its entirety radially outside of the hammer tube **12***a*. The damping means **16***a* in this case encloses the hammer tube **12***a* in the manner of a ring, on a plane perpendicular to the center axis **42**.

In addition, the B-impact damping system **14***a* has a no-load control means **20***a*, a guide means **50***a*, driving pins **52***a*, a spacer means **54***a*, a counterpressure spring **56***a*, a support disk **58***a* and a retaining ring **60***a*. The guide means **50***a* surrounds a tapered region **62***a* of the impact means **36***a*. It is realized as a guide bushing. The guide means **50***a* is mounted on the impact means **36***a* so as to be movable as far as a limit stop surface **64***a* of the impact means **36***a*. The driving pins **52***a* are disposed in a form fit manner in recesses of the guide means **50***a*. The driving pins **52***a* extend through the hammer tube **12***a*. On an outer side of the hammer tube **12***a*, the driving pins **52***a* engage in the spacer means **54***a*. The spacer means **54***a* is realized as a sleeve. The spacer means **54***a* surrounds the hammer tube **12***a*.

The impact means **36***a* transfers a recoil energy to the guide means **50***a* via the limit stop surface **64***a*. The guide means **50***a* transfers the recoil energy on to the driving pins **52***a*. The driving pins **52***a* direct the recoil energy out of the hammer tube **12***a*. On the outside of the hammer tube **12***a*, the driving pins **52***a* transfer the recoil energy on to the spacer means **54***a*. The spacer means **54***a* transfers the recoil energy on to the damping means **16***a*. The damping means **16***a* deforms as a result of the recoil energy and, in so doing, converts a part of the recoil energy into thermal energy. The damping means **16***a* delivers a part of the recoil energy on to the no-load control means **20***a*. This part has a significantly lesser amplitude of a recoil force than the recoil energy transferred by the impact means **36***a*.

During an impact, the no-load control means **20***a* supports the damping means **16***a*, and thus delivers a portion of the recoil energy to the hammer tube **12***a*. For this purpose, the retaining ring **60***a* engages in a groove **66***a* in the hammer tube **12***a*. The support disk **58***a* is disposed between the retaining ring **60***a* and the no-load control means **20***a*. The no-load control means **20***a* thus transfers a part of the recoil energy to the hammer tube **12***a*.

The no-load control means **20***a* is mounted so as to be movable relative to the hammer tube **12***a*, for the purpose of switching the impact operation on and off. When an operator presses the insert tool **46***a* against the workpiece at the start of a working operation, the operator is moving the no-load control means **20***a*. For this purpose, the insert tool **46***a* displaces a part of the B-impact damping system **14***a* against a force of the counterpressure spring **56***a*, i.e. the B-impact damping system **14***a* apart from the support disk **58***a* and the retaining ring **60***a*. The no-load control means **20***a* in this case closes a control opening **68***a* of the hammer tube **12***a*. It is only when the control opening **68***a* is closed that the piston **40***a* can build up the working air pressure inside the hammer tube **12***a*, which working air pressure moves the striker **38***a*. When the operator removes the force of the insert tool **46***a* against the workpiece, the counterpressure spring **56***a* displaces the no-load control means **20***a* in the main working direction **44***a*. The no-load control means **20***a* thereby releases the control opening **68***a*.

FIGS. **3** and **4** show two further exemplary embodiments of the disclosure. To distinguish the exemplary embodiments, the letter a in the references of the exemplary embodiments in FIGS. **1** and **2** has been replaced by the letters b and c in the references of the exemplary embodiments in FIGS. **3** and **4**. The descriptions that follow are limited substantially to the differences between the exemplary embodiments and, in respect of components, features and functions that remain the same, reference may be made to the description of the other exemplary embodiments, in particular in FIGS. **1** and **2**.

FIG. **3** shows a further exemplary embodiment of a hand power tool device **10***b* according to the disclosure. Like the hand power tool device from FIG. **2**, the hand power tool device **10***b* is shown in a no-load operating state and during an impact. The hand power tool device **10***b* has a hammer tube **12***b* and a B-impact damping system **14***b*. The B-impact damping system **14***b* has two damping means **16***b*, **17***b* that are connected in series, a support element **24***b* and a spacer means **54***b*. During operation, at least 25% of a recoil energy acts upon the damping means **16***b*, **17***b*. The damping means **16***b*, **17***b* damps the recoil energy without a limit stop. The damping means **16***b*, **17***b* are disposed radially outside of the hammer tube **12***b* and surround the hammer tube **12***b*.

The support element **24***b* is disposed between the damping means **16***b*, **17***b*. The support element **24***b* surrounds the hammer tube **12***b*. In addition, it is mounted in an axially movable manner on the hammer tube **12***b*. The support element **24***b* has two concavely shaped support surfaces **70***b*, on which, respectively, there bears one of the damping means **16***b*, **17***b*. In addition, the support element **24***b* has a bypass means **26***b*. The bypass means **26***b* is realized as a formed-on element. The bypass means **26***b* extends in the axial direction along one of the damping means **16***b*, **17***b* or, more precisely, along the damping means **16***b*, which is disposed facing toward the spacer means **54***b*. When the damping means **16***b* is compressed by the recoil energy, a distance between the bypass means **26***b* and an adjacent element, in this case the spacer means **54***b*, is reduced. Upon a certain compression of the damping means **16***b*, the bypass means **26***b* bypasses the damping means **16***b*, i.e. the bypass means **26***b* prevents further compression of the damping means **16***b*.

The damping means **16***b*, **17***b* have differing damping properties. The damping means **16***b* that can be bypassed has a softer spring characteristic than the other damping means **17***b*. Furthermore, the support element **24***b* has a further formed-on element **72***b*, which has a shorter axial length than the bypass means **26***b*. This formed-on element prevents overloading of the damping means **16***b*, which is disposed facing away from the spacer means **54***b*.

FIG. **4** shows a further exemplary embodiment of the hand power tool device **10***c* according to the disclosure. Like the hand power tool device from FIG. **2**, the hand power tool device **10***c* is shown in a no-load operating state and during an impact. The hand power tool device **10***c* has a hammer tube **12***c*, a B-impact damping system **14***c*, an impact means **36***c*, a control opening closure means **74***c* and a support means **76***c*. The B-impact damping system **14***c* has three damping means **16***c*, **17***c*, **18***c* connected in series, a guide means **50***c*, a counterpressure spring **56***c* and two support elements **24***c*, **78***c*. During operation, at least 25% of a recoil energy acts upon the damping means **16***c*, **17***c*, **18***c*.

The inner damping means **18***c* is disposed inside the hammer tube **12***c*, specifically functionally between the impact means **36***c* and the guide means **50***c*. The inner damping means **18***c* could thus also be integrated into the hand power tool devices of the first two exemplary embodiments. Owing to the inner damping means **18***c*, the other, outer damping means **16***c*, **17***c* can advantageously be small in size. The outer damping means **16***c*, **17***c* in this case have a lesser spring hardness than the inner damping means **18***c*. The outer damping means **16***c*, **17***c* are deformable over a greater distance than the inner damping means **18***c*.

The outer damping means **16***c*, **17***c* are disposed radially outside of the hammer tube **12***c*. One of the support elements **24***c* is disposed between the outer damping means **16***c*, **17***c*. The other support element **78***c* is disposed between the outer damping means **16***c*, **17***c* and the support means **76***c*. The support elements **24***c*, **78***c* are fixedly connected to the hammer tube **12***c* by means of retaining rings **80***c*. The outer damping means **16***c*, **17***c* and the support elements **24***c*, **78***c* are biased. When the operator presses a hand power tool **30***c* comprising the hand power tool device **10***c* onto a workpiece, the hammer tube **12***c* bears on a hand power tool housing **22***c* of the hand power tool **30***c*, via the B-impact damping system **14***c*.

After an impact, a part of the recoil energy from the impact means **36***c* acts upon the outer damping means **16***c*, which is the middle damping means in the axial direction, via the inner damping means **18***c*, a driving pin **52***c* and a spacer means **54***c* of the B-impact damping system **14***c*. The recoil energy compresses the middle damping means **16***c* until, in a recess **82***c*, the driving pin **52***c* strikes against the hammer tube **12***c*. The hammer tube **12***c* is realized partially as a bypass means **28***c*. Via the hammer tube **12***c* and the first support element **24***c*, a part of the impact energy acts upon the outer damping means **17***c*, which is the front damping means in the main working direction **44***c*. The support means **76***c* supports the front damping means **17***c* on the hand power tool housing **22***c*.

The hammer tube **12***c* is mounted so as to be movable relative to a hand power tool housing **22***c*. A control opening closure means **74***c* is fastened so as to be immovable relative to the hand power tool housing **22***c*. When an operator presses an insert tool **46***c* against a workpiece at the start of a working operation, the operator is moving the hammer tube **12***c*, i.e. moving it contrary to a main working direction **44***c*. For this purpose, the insert tool **46***c* displaces a part of the B-impact damping system **14***c* against a force of the counterpressure spring **56***c*, i.e. the B-impact damping system **14***c* apart from the support means **76***c*. The support means **76***c* is fixedly connected to the hand power tool housing **22***c*. The control opening closure means **74***c* in this case closes a control opening **68***c* of the hammer tube **12***c*. When the operator removes the force of the insert tool **46***c* against the workpiece, the counterpressure spring **56***c* displaces the hammer tube **12***c* in the main working direction **44***c*. The control opening closure means **74***c* thereby releases the control opening **68***c*. A control opening closure means could advantageously be realized so as to have an at least partially integral plain bearing, thereby enabling a saving to be made on a component.

The invention claimed is:

1. A hand power tool device comprising:
- a hammer tube; and
- a B-impact damping system, the B-impact damping system including at least two damping mechanisms connected in series, at least one of the at least two damping mechanisms configured to damp a recoil energy without a limit stop,
- wherein at least one of the at least two damping mechanisms is disposed entirely radially outside of the hammer tube, and
- wherein the B-impact damping system has at least one bypass mechanism configured to bypass at least one of the at least two damping mechanisms.

2. The hand power tool device as claimed in claim **1**, wherein at least one of the at least two damping mechanisms at least partially surrounds the hammer tube.

3. The hand power tool device as claimed in claim **1**, wherein the B-impact damping system includes a no-load control mechanism configured to transfer at least a part of the recoil energy.

4. The hand power tool device as claimed in claim **3**, wherein the no-load control mechanism is configured to transfer the at least a part of the recoil energy to at least one of the hammer tube and a hand power tool housing.

5. The hand power tool device as claimed in claim **1**, wherein the B-impact damping system has at least one support element disposed between the at least two damping mechanisms.

6. The hand power tool device as claimed in claim **1**, wherein the at least two damping mechanisms have differing damping properties.

7. The hand power tool device as claimed in claim **1**, wherein the hammer tube is mounted so as to be movable relative to a hand power tool housing.

8. A hand power tool, comprising:
- a hand power tool device, including:
  - a hammer tube; and
  - a B-impact damping system, the B-impact damping system including at least two damping mechanisms connected in series, at least one of the at least two damping mechanisms configured to damp a recoil energy without a limit stop,
  - wherein at least one of the at least two damping mechanisms is disposed entirely radially outside of the hammer tube, and
  - wherein the B-impact damping system has at least one bypass mechanism configured to bypass at least one of the at least two damping mechanisms.

9. A hand power tool device, comprising:
- a hammer tube; and
- a B-impact damping system, including:
  - at least two damping mechanisms configured to damp a recoil energy, at least one of the at least two damping mechanisms disposed radially outside of the hammer tube; and
  - at least one bypass mechanism configured to bypass at least one of the at least two damping mechanisms.

10. The hand power tool device as claimed in claim **9**, wherein at least one of the at least two damping mechanisms surrounds the hammer tube.

11. The hand power tool device as claimed in claim **9**, wherein the B-impact damping system includes a control mechanism configured to transfer at least a part of the recoil energy.

12. The hand power tool device as claimed in claim **11**, wherein the control mechanism is configured to transfer the at least a part of the recoil energy to at least one of the hammer tube and a hand power tool housing.

13. The hand power tool device as claimed in claim **9**, wherein the at least two damping mechanisms are spaced apart from one another along an axial direction of the hand power tool device.

14. The hand power tool device as claimed in claim **9**, wherein the B-impact damping system has at least one support element disposed between the at least two damping mechanisms.

15. The hand power tool device as claimed in claim **9**, wherein the at least two damping mechanisms have differing damping properties.

16. The hand power tool device as claimed in claim **9**, wherein the hammer tube is mounted so as to be movable relative to a hand power tool housing.

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